

the closely related species but the description is too inadequate to place it accurately in this difficult and variable group. The type was a specimen grown in England in 1837 by G. Barker Esq. from seed sent from Mexico.

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NOTES FROM THE HERBARIUM OF THE UNIVERSITY
OF WISCONSIN—XVII. ELATINE AND OTHER
AQUATICS

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This study of *Elatine* as it occurs in North America is largely the result of support by the Wisconsin Alumni Research Foundation. The writer is indebted to the curators of the herbaria of the Missouri Botanical Garden, the Field Museum, the University of Minnesota, Iowa State College, and of the Gray Herbarium, for loans of material, and to Miss Nell C. Horner, Librarian at the Missouri Botanical Garden, for assistance in locating much of the literature. The drawings of seeds are by my student, Miss Elizabeth A. Chavannes.

Individuals of any species of *Elatine* grown under different conditions, as when some are submerged and others stranded on the mud, resemble each other less closely than do individuals of different species grown under similar conditions. No more reliable than habit are other vegetative characters, such as size and shape of stipules. The shape of leaves seems in some cases correlated with geographic range. In the seeds is found the most satisfactory basis for classification. There are three perfectly distinct seed types in North America, but groups within one of these types, here all "lumped" under *E. triandra*, show great variation in the size of seeds and the number of pits on the seed-coat. These will be discussed under that species.

For handling these minute seeds, none of them more than 750 μ long, it was found most practical to mount them on strips of film about 1 x 2 cm., after which they could be easily handled under a compound microscope. Acetate film was used; discarded safety-base film, with the emulsion removed by boiling, is the most easily available source. In cases where ample material lies in a packet, loose seeds can often

be located with a binocular microscope; a piece of film is smeared with an acetone solution of film, and the seeds taken up as by blotting. In other cases a capsule is carefully opened with needles and a few seeds laid on the film. A drop of acetone is then run over it, and enough of the film is dissolved to make the seeds adhere without obscuring their surfaces in the least.

The genus *Elatine*, as it occurs in North America, may be classified as follows:

- a. Capsule with 2-3 carpels, sessile; seeds straight or slightly curved, nearly uniformly rounded at each end. . . . b.
- b. Seed-coat with pits rounded at the ends, their ends not extending between the ends of pits in adjacent rows; pits scarcely reduced in size toward the ends of the seed; carpels usually 2. *E. minima*.
- b. Seed-coat with pits 6-sided, angled at the ends, their ends extending between the ends of pits in adjacent rows; pits somewhat narrower and less distinct toward the ends of the seed; carpels 3. *E. triandra*.
- c. Seeds 400-700 μ long, 140-250 μ thick, with pits in rows of 16-25 each. . . . d.
- d. Leaves linear to spatulate, often emarginate at tip. *E. triandra* var. *genuina*.
- e. Aquatic forms with branches erect from creeping stems; internodes (1.5) 3.5-14 mm. long and 0.5-1.5 mm. thick; leaves 2.8-13 mm. long and (0.5) 0.8-2 mm. wide, bright green, translucent. . . . f.
- f. Internodes (1.5) 3.5-14 mm. long; leaves 3-13 mm. long. *E. triandra* f. *submersa*.
- f. Internodes (1.5) 3-8.5 mm. long; leaves 2.8-6.5 mm. long. *E. triandra* f. *intermedia*.
- e. Terrestrial forms with much branched creeping stems and prostrate leaves; internodes 0.5-5 mm. long and 0.3-0.8 mm. thick; leaves 2-5 (6) mm. long and 0.5-1 (1.8) mm. wide, dark green, often reddish and shining, opaque. *E. triandra* f. *terrestris*.
- d. Leaves obovate, only rarely emarginate. *E. triandra* var. *americana*.
- c. Seeds 350-600 μ long, 160-280 μ thick, with pits in rows of 9-15 each. . . . g.
- g. Leaves linear to narrowly oblong. *E. triandra* var. *brachysperma*.
- g. Leaves obovate. *E. triandra* var. *obovata*.
- a. Capsule with 4 carpels, peduncled; seeds U-shaped or J-shaped, rounded at one end and truncate and subapiculate at the other. . . . h.
- h. Leaves obtuse or rounded at tip. *E. californica*.
- h. Leaves slightly emarginate at tip. *E. californica* var. *Williamsii*.

E. MINIMA (Nutt.) Fisch. & Meyer, *Linnaea* x. 73 (1836); Fernald, *RHODORA* xix. 13 (1917). For full synonymy see Fernald, l. c.—MAP 1; FIG. 1.—The following may be added to the collections cited by Fernald. PRINCE EDWARD ISLAND: shallow water, sandy margin of Lake Verde, August 9, 1912, *Fernald, Long & St. John*, no. 7765 (Gray; N. Y.). NOVA SCOTIA: sandy and muddy tidal flats of Tusket

River, Tusket Falls, August 20, 1920, *Fernald, Bissell, Graves, Long & Linder*, no. 21884 (Gray; Mo.; Field); shallow water at sandy margin of Harper's Lake, Shelburne County, August 5, 1921, *Fernald & Long*, no. 24164 (Gray; N. Y.). MASSACHUSETTS: on mud, Maxcy's Pond, Nantucket Island, September 12, 1907, *E. P. Bicknell* (N. Y.). NEW YORK: in sand, submerged in 1 m. of water, West Caroga Lake, Fulton County, August 19, 1934, *Muenschler & Clausen*, no. 4521 (Mo.). MICHIGAN: Sister Lakes, Van Buren County, *Arthur W. DeSelm*, no. 23 (Field). ONTARIO: Pothole Portage, Sudbury District, August 20, 1932, *Fassett*, no. 14607 (Mo.; Wis.); Port Sandfield, Lake Muskoka, September 1, 1889, *Dr. & Mrs. N. L. Britton & Miss Millie Timmerman* (N. Y.). WISCONSIN (selected from 26 collections in the Herbarium of the University of Wisconsin): Cable Lake, Spooner, September 12, 1929, *Fassett & McLaughlin*, no. 12673; Drummond, September 11, 1934, *Steenis & Sanford*; in 1 m. water, Bass Lake, Hayward, August 17, 1929, *E. M. Gilbert & N. C. Fassett*, no. 12669; sandy shore, Hanscom Lake, Web Lake, September 21, 1928, *Fassett*, no. 12675; Little John Jr. Lake, Trout Lake P. O., August 3, 1932, *L. R. Wilson*, no. 3030; Lake St. Croix, Solon Springs, July 27, 1931, *J. H. Steenis*, no. 578; sandy shore, Crystal Lake, Comstock, August 29, 1929, *W. T. McLaughlin*; in 2 dm. water, sand bottom, Malby Lake, Minocqua, September 13, 1927, *Fassett*, no. 5371. MINNESOTA: growing on sandy lake shore and in shallow water, Pfrinner's Lake, north of Woman Lake, Cass County, September 3, 1929, *C. O. Rosendahl*, no. 6099 (Minn.).

In the middle west this is always in sand, in contrast to *E. triandra* which favors mud. In the east it also occurs on muddy tidal shores. It is more uniform in habit than is *E. triandra*, although Bicknell¹ described some variation with habitat.

E. TRIANDRA Schkuhr, Bot. Handb. i. 345, t. 109b, fig. 2 (1791).
MAP 2, FIG. 2.

E. triandra var. **genuina** (*E. triandra* Schkuhr) of Europe appears inseparable from the North American plant. Its American range (Map 2) is scattered from southern Canada to Mexico, and from the Pacific coast states to Wisconsin and Texas. It is mostly at high elevations, and seems to occupy lakes and intermittent pools. In Wisconsin its occurrence is probably related to the Driftless Area.² Its scattered range in the western states suggests an ancient distribution, perhaps correlated with a past era of greater humidity than at present. That the isolations are of great antiquity is indicated by the behavior of the seeds, which from locality to locality vary in size,

¹ As *E. americana*, in Bull. Torr. Bot. Club xl. 612-613 (1913).

² See Fassett, Trans. Wis. Acad. xxv. 199-200 (1930).

proportions, and number of pits, but are remarkably constant at each locality.

In North America, as in Europe, *E. triandra* occurs in 3 more or less arbitrarily distinguished forms. Forma *submersa* Seubert is long-stemmed and limp, and is described by Glück¹ as growing in from 10–40 cm. of water. This is the only form occurring, almost certainly as an introduction, in Skowhegan, Maine, as reported by Fernald, l. c. Individuals closely resembling the Skowhegan plant, but without doubt native, have been collected by the writer in Wisconsin, where they were accompanied by the other two forms. The occurrence of but one form at Skowhegan is due simply to the fact that the pond has been enlarged and the grassy banks round off sharply into the water, so there is no opportunity for any but f. *submersa* to grow.

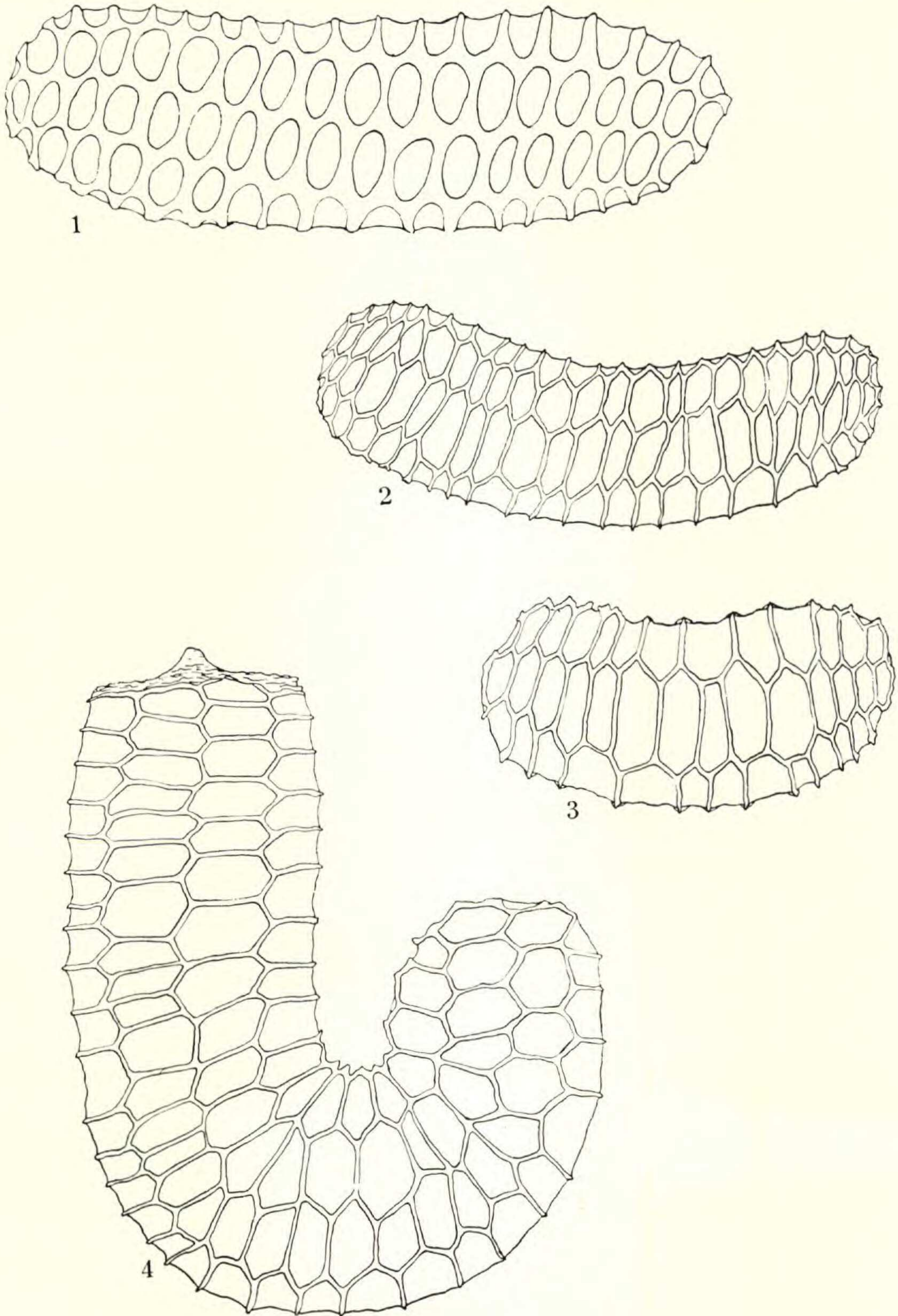
Forma *terrestris* occurs on the mud, and is the most common form in western North America, where it apparently grows in pools that dry up as the season progresses. The flowers usually open and are more conspicuous than in the submerged forms. The plants often take on a red coloring; such red individuals have been described as *E. rubella* Rydb.²

Forma *intermedia* Seubert has flowers which, according to Glück, sometimes open and sometimes remain closed. It is a shallow water form.

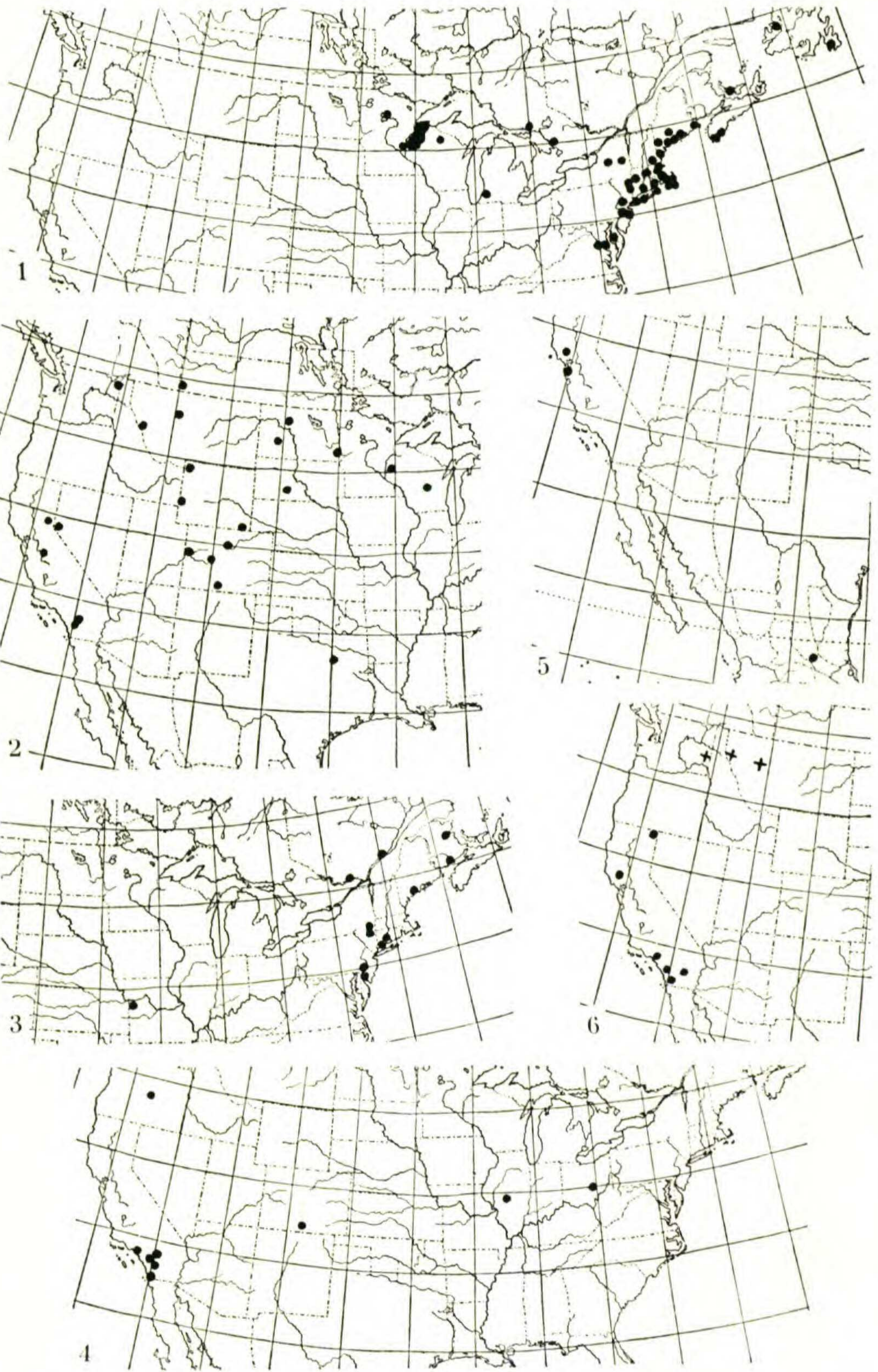
The following collections of *E. triandra* var. *genuina*, including the three forms, have been examined. MAINE: bottom of little pond, Park, Skowhegan, October 28, 1916, *L. H. Coburn* (Gray); small pond in Coburn Park, Skowhegan, August 20, 1931, *Fassett*, no. 13564 (Gray; Field; Wis.). This locality is not indicated on Map 2, the plant there being almost certainly an introduction. WISCONSIN: Kettleson Pond, 5 miles east of Wisconsin Dells, July 24, 1932, *Fassett & Hotchkiss*, no. 14533 (Wis.); in 1 dm. water, kettlehole in the Johnstown Moraine, 10 miles northeast of Kilbourn (now Wisconsin Dells), Big Spring, September 22, 1929, *Fassett, Uhler & McLaughlin*, no. 9136 (Wis.) & 9137 (Gray; Field); shallow water, soft mud bottom, Round Lake, St. Croix Falls, September 5, 1927, *Fassett & Wilson*, no. 15290 (Wis.; Gray). NORTH DAKOTA: on bottom of muddy pool, a mile north of the college campus, Minot, June 30, 1930, *Olga Lakela*, no. 468 (Minn.); mud, low place in field, Wild Rice, August 27, 1919, *O. A. Stevens*, no. 726 (Minn.); in dried mud of pond, Glen Ullin, July 25, 1912, *H. F. Bergman*, no. 2447 (Minn.). SOUTH DAKOTA: Belvidere, August, 1928, *John W. Moore*, no. 841 (Minn.).

¹ Die Süßwasser-Flora Mitteleuropas xv. 299–300 (1936).

² Mem. N. Y. Bot. Gard. i. 260 (1900).



Seeds of ELATINE, $\times 100$. FIG. 1, *E. MINIMA*; FIG. 2, *E. TRIANDRA* var. *GENUINA*; FIG. 3, *E. TRIANDRA* var. *BRACHYSPERMA*; FIG. 4, *E. CALIFORNICA*.



Ranges of ELATINE. MAP 1, *E. MINIMA*; MAP 2, American range of *E. TRIANDRA* var. *GENUINA*; MAP 3, *E. TRIANDRA* var. *AMERICANA*; MAP 4, *E. TRIANDRA* var. *BRACHYSPERMA*; MAP 5, *E. TRIANDRA* var. *OBOVATA*; MAP 6 (dots), *E. CALIFORNICA*, (crosses) *E. CALIFORNICA* var. *WILLIAMSII*.

ALBERTA or SASKATCHEWAN: Cypress Hills, August 3, 1880, *J. Macoun* (Gray). MONTANA: Lower Sand Coulee, August 25, 1891, *R. S. Williams*, no. 854 (Minn.); on edge of ponds, Missoula, September 11, 1898, *Williams & Griffiths* (Mo.). WYOMING: Alpine, Lincoln County, on the Snake River, near the Idaho boundary, July 9, 1923, *Payson & Armstrong*, no. 3434 (Mo.; Ia.; Gray); wet meadows, Sherman, July 19, 1889, *J. E. Bodin* (Minn.); growing on the bottom, Yellowstone Lake, 1885, *Frank Tweedy*, no. 408 (Field; Gray); muddy shore of Yellowstone Lake, 1885, *Tweedy*, no. 439 (type of *E. rubella* Rydb.) (Field; Gray). COLORADO: Denver, 1878, *M. Jones* (Mo.); near Twin Lakes, 1875, *Hayden Survey*, no. 4472 (Mo.); San Luis Valley, 1873, *John Wolf*, no. 990 (Field); Loma on Rio Grande, Col. Ter., 1873, *John Wolf*, no. 309 (Field); borders of drying pond, North Denver, September 20, 1910, *Alice Eastwood* (Gray); banks of a pond in Middle Park, 1868, *Geo. Vasey* (Gray). NEW MEXICO: mountain streams, Coppermine, 1851, *C. Wright* (Mo.). TEXAS: muddy early in the spring, Dallas County, March, 1874, *J. Reverchon* (Mo.). WASHINGTON: Usk, August 1, 1902, *Frank O. Kreager*, no. 367 (N. Y.; Minn.; Gray). OREGON: mud, Max's Boltoni below Portland, September 15, 1883, *L. F. Henderson*, no. 143 (Mo.); abundant, pond in Salem, September, 1871, *Elihu Hall* (Field); borders of ponds, Sauvies Island, October, 1874, *Joseph Howell* (Field). NEVADA: Lake Washoe, 1865, *J. Torrey*, no. 52 (N. Y.). CALIFORNIA: shallow pool, 3 miles below Helmet Valley, San Jacinto Mts., 450 ft., July 4, 1922, *P. A. Munz*, no. 5969 (Pomona); edge of water, Dry Lake, San Bernardino Mts., 9100 ft., September 23, 1922, *Munz*, no. 6282 (Pomona); baked clay soil of desiccated rain-pool, 3 miles n.w. of Merced, April 27, 1929, *John Thomas Howell*, no. 4208 (Pomona); Weber Lake, 1886, *Lemmon* (Gray). MEXICO: Mound Valley, Sierra Madre Mts., Chihuahua, alt. 7000 ft., September 16, 1903, *M. E. Jones*, no. 7321 (Gray).

E. TRIANDRA var. *AMERICANA* (Pursh) Fassett, RHODORA xxxiii. 73 (1931), where synonymy is given and distribution discussed.—MAP 3. The following may be added to the specimens cited by Fernald, l. c. QUEBEC: tidal mud of the St. Lawrence, Cap Rouge, September 14, 1931, *M. L. Fernald*, no. 2531 (Gray); tidal mud of the St. Lawrence, Anse St. Vallier, September 15, 1931, *Fernald*, no. 2532 (Gray). NEW BRUNSWICK: tidal shore, Kennebecasis River, Lakeside, August 25, 1923, *Svenson & Fassett*, no. 2015 (Gray); muddy tidal shore, Miramichi River, 5 miles above Newcastle, August 19, 1923, *Svenson & Fassett*, no. 2016 (Gray); tidal shores of the St. John River, Westfield, August 20, 1924, *Fassett*, no. 2288 (Gray). NEW YORK: muddy tidal shores of Hudson River, Coeymans, September 22, 1923, *Svenson* (Gray); tidal muddy shores of Hudson River, Hudson, September 30, 1923, *Svenson* (Gray). MISSOURI: common in swales, Atherton, June 27, 1898, *B. F. Bush*, no. 131 (Mo.; Field; Gray).

The station in Missouri is far removed from the essentially estuarine remainder of the range, but the writer is unable to separate the three sheets examined from the eastern plants.

E. TRIANDRA var. **brachysperma** (Gray), n. comb. *E. brachysperma* Gray, Proc. Am. Acad. xiii. 361 (1878).—MAP 4; FIG. 3.

Ordinarily this appears quite distinct from var. *genuina*, but occasional specimens are intermediate in seed characters and must be classified somewhat arbitrarily; moreover, the South American representative¹ of *E. triandra* stands just between var. *genuina* and var. *brachysperma* in many characters. These characters are as follows: *E. triandra* vars. *genuina* & *americana*, seeds 400–720 μ long and 140–250 μ thick with 6–8 rows of 16–25 pits each; var. *andina*, seeds 460–680 μ long and 160–280 μ thick with 8–10 rows of 12–19 pits each; var. *brachysperma*, seeds 350–600 μ long and 160–300 μ thick and with 6–8 rows of 9–16 pits each.

The range of var. *brachysperma* is somewhat similar to that of var. *genuina*, but most curiously disrupted; it is less common except in southern California. In the middle west it has been collected in pools in the Illinoian drift in central Illinois, and in Wisconsin drift in Ohio.

The following collections have been studied: OHIO: margin of pond 2 mi. south of Circleville, Pickaway Twp., Nov. 10, 1925, *Pontius & Bartley* (N. Y.). ILLINOIS: floating in a pond and rooting on its muddy margins, Springfield, *Bebb* (Field); floating in water, Springfield, *Bebb* (Field); Springfield, *Bebb* (other collections apparently made at different times, Mo.; N. Y.; Gray); Athens, 1861, *E. Hall* (Gray). TEXAS: [without locality] 1850, *Chas. Wright* (Mo.); in a dried up pool, Grosbeck, Limestone County, March, 1878, *J. F. Joor* (Mo.); Hempstead, 1872, *Elihu Hall*, no. 37 (N. Y.) (this number in Mo. is var. *genuina*). ARIZONA: Spring Valley, near the San Francisco Mts., September, 1884, *J. G. Lemmon*, no. 3313 (Gray). NEW MEXICO: Copper Mines, *Bigelow* (N. Y.). OREGON: Farewell Bend, Crook County, 1270 m., July 7, 1894, *J. B. Leiberg*, no. 462 (Mo.; N. Y.). CALIFORNIA: Mesas, San Diego County, April 25, 1884, *C. R. Orcutt*, no. 1402 (Mo.); in very shallow water or on the borders of it, Bear Valley, San Bernardino Mts., *S. B. & W. F. Parish*, no. 1430 (Mo.; Field) and 1431 (N. Y.; Gray); near Santa Monica, Los Angeles County, October, 1889, *Dr. H. E. Hassé* (Field; Pomona); Bear Valley, margins of the lake, August 5, 1902, *LeRoy Abrams*, no. 2910

¹ *E. TRIANDRA* var. **andina**, n. var., seminibus 460–680 μ longis, 160–280 μ diametro, cum 8–10 lineis 12–19-alveolis; foliis var. *genuinam* simulantibus.—Prov. Lareaja vic. Sorata, in lacunis uliginosis 1200–3100 metres reg. temp. & alpine, Andes Boliviae, *J. Mandon* (TYPE in Herb. Missouri Botanical Garden); in turfis udis montis la Leona, Rancagua, Chili, October, 1828, *Bertero*, no. 233 (Mo.).

(N. Y.; Pomona); dessicated pools at north end, Red Hill, Upland, 1500 ft., May 22, 1922, *P. A. Munz*, no. 5557 (Pomona); dried mud flat, Menifee Valley, Riverside County, May 19, 1922, *Munz & Johnston*, no. 5569 (Pomona); Ramona, San Diego County, May 25, 1903, *Brandegge*, no. 3378 (Pomona; Gray); drying vernal pool south of Ramona, San Diego County, May 3, 1938, *Edith A. Purer*, no. 6945 (Pomona); Inglewood, Los Angeles County, April, 1901, *LeRoy Abrams*, no. 1449 (Pomona); frequent, water and on shore, Hidden Lake, San Jacinto Mts., September 6, 1922, *Munz*, no. 6379 (Pomona); drying pool 1 mile north of Laguna on bluff near club house, Laguna Beach, 200 ft., April 12, 1921, *Munz*, no. 4478 (Pomona); drying banks in wet meadows, Bluff Lake, San Bernardino Mts., 7400 ft., June 26, 1926, *Munz*, no. 10533 (Pomona); dry mud flat, Mystic Lake near Moreno, 1500 ft., June 21, 1921, *Munz & Johnston*, no. 5546 (Pomona).

E. TRIANDRA var. **obovata**, n. var., seminibus eis var. *brachyspermi* simulantibus; foliis obovatis apice rotundatis 2–5 mm. longis 1.5–2 mm. latis.—MAP 5.—CALIFORNIA: Jordan's Pond, Kelseyville, July 3, 1929, *J. W. Blankinship* (TYPE in Herb. Missouri Botanical Garden); Presido, May, 1891, *Michener & Bioletti* (Gray). MEXICO: near Morales, San Luis Potosi, 1879, *Wilh. Schaffner* (N. Y.); same, no. 464 (Pomona; Minn.; Ia.) and 1876, no. 122 (Gray).

This stands to var. *brachysperma* as var. *americana* does to var. *genuina*. It seems to replace other forms in two widely separated areas.

E. CALIFORNICA Gray, Proc. Am. Acad. xiii. 361 (1878).—MAP 6, dots.—CALIFORNIA: vernal pool, Camp Kearney, Mesa, March 2, 1937, *Edith A. Purer*, no. 7116 (Mo.); submerged, Jordan's Pond, Kelseyville, July 3, 1929, *J. W. Blankinship* (Mo.); near Soldier's House, Los Angeles County, September, 1889, *Dr. E. E. Hasse* (Mo.; Gray); on sunny shore and in shallow water, South Mt. Reservoir, Devil's Garden, alt. 5000 ft., Modoc County, August 23, 1935, *Louis C. Wheeler*, no. 3913 (N. Y.); Santa Monica, *Hasse* (N. Y.; Pomona); mud at lake edge, Laguna Cañon, May 4, 1918, *I. M. Johnston* (Pomona); edge of small pool on Garner Ranch, 4550 ft., Helmet Valley, San Jacinto Mts., May 21, 1922, *Munz & Johnston*, no. 5520 (Gray; Pomona); muddy bank, Laguna Lake, San Diego County, 5000 ft., June 25, 1924, *Munz*, no. 8392 (Pomona); common on wet shore, Cuyamaca Lake, San Diego County, 4600 ft., June 27, 1923, *Munz & Harwood*, no. 7221 (Pomona); shallow pool, Kenworthy, San Jacinto Mts., 4750 ft., May 20, 1922, *Munz & Johnston*, no. 5460 (Pomona); drying mud-flat, ½ mile south of Lake Elsinore, April 29, 1922, *Munz & Johnston*, no. 5066 (Pomona); Sierra Valley, February, 1878, *J. G. Lemmon* (TYPE in Gray Herbarium).

E. CALIFORNICA var. **Williamsii** (Rydb.), n. comb. *E. Williamsii* Rydb. Mem. N. Y. Bot. Gard. i. 260 (1900).—MAP 6, crosses.—WASHINGTON: Spokane, in dried-up pond-bottoms, June 25, 1897,

C. V. Piper, no. 2643 (Gray); borders of ponds, Spokane County, June 28, 1884, *W. N. Suksdorf*, no. 640 (Mo.; Field) and 258 (Gray). MONTANA: Missoula, September 8, 1894, *Williams & Griffiths* (Mo.); Sand Coulee, Big Belt Mts., August 25, 1891, *R. S. Williams* (Mo., marked "855 & 844," "Type"); lake in Lower Sand Coulee, September 3, 1891, *R. S. Williams*, no. 855 (Gray, marked "Type specimen"; N. Y.; Minn.).

Rydberg characterizes this as differing from *E. californica* by being "more slender, with thinner leaves and much smaller seeds," differences which the writer must admit his inability to see.

HYPERICUM BOREALE (Britton) Bicknell, f. **callitrichoides**, n.f., plantae submersae, simplices, steriles; caule flexili; foliis rotundatis, 3-6 mm. longis, trinerviis, fere sine punctis pellucidis.—Completely submerged, quiet cove, Damariscotta Lake, Jefferson, Maine, August 22, 1936, *Fassett*, no. 18068 (TYPE in Herb. University of Wisconsin); Bass Lake, Summit Lake P. O., Wisconsin, June 22, 1932, *J. H. Steenis & L. R. Wilson* (Wis.).

H. ELLIPTICUM Hook., f. **submersum**, n. f., plantae submersae, simplices, steriles; foliis rotundatis vel ovatis, penninervatis, interdum pellucido-punctatis.—In shallow water, Pipe Lake, Jack Wilson's Resort, Walford, Ontario, August 5, 1936, *Fassett*, no. 19172 (TYPE in Herb. University of Wisconsin).

Most collecting has been done, obviously, for herbaria, with emphasis on well-developed flowering or fruiting specimens. With the present interest in conservation, however, much collecting is taking the form of an inventory of aquatic vegetation. In some lakes the forms here described are as definitely a part of the flora as is the *Callitriche* they resemble. Often, such aquatic derivatives of terrestrial plants lose the characteristics by which their normal forms are most readily identified: *H. boreale* lacks the pellucid dots ordinarily associated with a *Hypericum*; *Pontederia cordata* f. *taenia*¹ can scarcely be told from a *Sparganium*, and *Gratiola lutea* f. *pusilla*² is quite without the glands which dot the ordinary *G. lutea*.

DIDIPLIS DIANDRA (Nutt.) Wood, f. **terrestris** (Koehne) n. comb. *Peplis diandra* f. *terrestris* Koehne in Engler's Bot. Jahrb. i. 264 (1881).

D. DIANDRA f. **aquatica** (Koehne) n. comb. *P. diandra* f. *aquatica* Koehne, l. c.

Peplis diandra Nutt. in DC. Prod. iii. 77 (1828), is described as having leaves subalternate toward the apex, 2 stigmas, and 2 stamens. Although this is an inaccurate description of the plant known as

¹ Fassett, RHODORA xxxix. 274 (1937).

² Pennell, Acad. Nat. Sci. Phila. Monographs i. 76 (1935).

Didiplis, or *Peplis*, *diandra*, the name is probably correctly applied. A specimen from the Academy of Natural Sciences of Philadelphia has been kindly loaned by Dr. Pennell; this sheet is marked "*Ptilina aquatica*" by Nuttall, and is a mixture of the two forms mentioned above. This sheet does not represent, in all probability, the type, which appears to have been sent to De Candolle.

LUDWIGIA PALUSTRIS (L.) Ell., var. AMERICANA (DC.) Fern. & Grise., forma **elongata**, nom. nov. *Ludwigia palustris*, f. *submersa* (Glück) Eames, sensu Eames, RHODORA xxxv. 229 (1933), not *Isnarda palustris*, f. *submersa* Glück, Biol. & Morph. Untersuchungen Wasser- und Sumpfgewächse iii. 155 (1911).

PHYSOSTEGIA **granulosa**, n. sp., planta stolonifera; foliis spatulato-oblongatis utrinque 4-8-dentatis; foliis superioribus reductis calycibus granulis densis vel capillis brevissimis instructis; floribus 20-25 mm. longis.—Plants stoloniferous; leaves spatulate-oblongate, with 4-8 pairs of teeth; calyx with dense minute gland-like hairs, each 2-3 times as long as thick.—QUEBEC: Cap Rouge, Co. de Quebec; grèves estuariennes, avec *Gentiana Victorinii*, *Bidens hyperborea*, *Isoetes Tuckermanni*, etc., 21 août 1928, F. Marie-Victorin, no. 28178 (TYPE in Herb. Univ. of Wisconsin); Cap Rouge, rivage estuarien, avec *Gentiana Victorinii*, apparamment atteint par la marée, 19 août 1925, F. Marie-Victorin, no. 21570.

This estuarine plant has the reduced upper leaves and large flowers of *P. virginiana*, as defined by Deam,¹ is stoloniferous like *P. speciosa*, has fewer teeth on the leaves than either, and a peculiar pubescence on the calyx unlike that of either. It is described² and illustrated³ by Frère Marie-Victorin, who states that it is confined to tidal shores.

P. SPECIOSA Sweet, var. **glabriflora**, n. var., floribus 16-20 mm. longis omnino glabris vel sparse brevissimeque puberulentibus; lobis calycis ciliatis.—Racine, WISCONSIN, T. J. Hale (TYPE in Herb. Univ. of Wisconsin).

Hale collected about 1861, and it is probable that this plant no longer exists about Racine. His collection consists of two plants in full flower, which differ strikingly from the usual *P. speciosa* in their lack of the velutinous indument of the calyx, and of the white pubescence ordinarily conspicuous, at least on opening buds, and usually on the mature corolla.

¹ Flora of Indiana, soon to be published. The writer is indebted to Mr. Deam for a copy of the manuscript of the part of the Flora dealing with this genus.

² Flore Laurentienne, 498 (1935).

³ Ibid., 497.